

# Foreword

## How Forecasts Are Made

Most of the annual streamflow in the Western United States originates as snowfall. This snowfall accumulates high in the mountains during winter and early spring. As the snowpack accumulates, hydrologists estimate the runoff that will occur when it melts. Predictions are based on careful measurements of snow water equivalent at selected Index points. Precipitation, temperature, soil moisture and antecedent streamflow data are viewed in conjunction with snowpack data to prepare runoff forecasts. This report presents a comprehensive picture of water supply outlook conditions for areas dependent upon surface runoff. It includes selected streamflow forecasts, summarized snowpack and precipitation data, reservoir storage data and narratives describing current conditions.

Streamflow forecasts are cooperatively generated by Soil Conservation Service and National Weather Service hydrologists. Forecasts become more accurate as more data affecting runoff becomes known. For this reason, forecasts are issued that reflect three future precipitation conditions — Below Normal, Average, and Above Normal. These forecasts are terms reasonable minimum, most probable, and reasonable maximum. Actual streamflow can be expected to fall between the lower and upper forecast values eight out of ten years.

Snowpack data are obtained by using a combination of manual and automated measurement methods. Manual readings of snow depth and water equivalent are taken at locations called snow courses on a monthly or semi-monthly schedule during the winter. In addition, snow water equivalent, precipitation, temperature, and other parameters are monitored on a daily basis and transmitted via radio telemetry to central data collection facilities. Both monthly and daily data are used to project snowmelt runoff.

## For More Information

Copies of Monthly Water Supply Outlook Reports and other reports may be obtained from the states listed below. An annual snow survey data summary is published by the Soil Conservation Service for each of the western states. Historical snow survey data may be obtained at those same offices.

STATE	ADDRESS
Alaska	201 East 9th Ave., Suite 300, Anchorage, AK 99501-3687
Arizona	201 East Indianola, Suite 200, Phoenix, AZ 85012
Colorado	2490 West 26th Ave., Denver, CO 80211
New Mexico	517 Gold Ave. S.W., Room 3301, Albuquerque, NM 87102-3157
Idaho	304 North 8th Street, Room 345, Boise, ID 83702
Montana	10 East Babcock, Room 443, Federal Building, Bozeman, MT 59715
Nevada	1201 Terminal Way, Room 219, Reno, NV 89502
Oregon	1220 Southwest 3rd Ave., Room 1640, Portland, OR 97204
Utah	4402 Federal Building, 125 South State Street, Salt Lake City, UT 84147
Washington	360 U.S. Court House, Spokane, WA 99201-1080
Wyoming	Federal Building, 100 East "B" Street, Casper, WY 82601

In addition to state reports, a Water Supply Outlook for the Western United States is published by the Soil Conservation Service and National Weather Service monthly, January through May. Reports may be obtained from the Soil Conservation Service, West National Technical Center, 511 Northwest Broadway, Room 248, Portland, OR 97209.

Published by other agencies:

Water Supply Outlook Reports prepared by other agencies include: California — Snow Survey Branch, California Department of Water Resources, P.O. Box 388, Sacramento, CA 95802; British Columbia — The Ministry of Environment, Water Investigations Branch, Parliament Buildings, Victoria, British Columbia, V8V 1X5; Yukon Territory — Department of Indian and Northern Affairs, Northern Operations Branch, 200 Range Road, Whitehorse, Yukon Territory, Y1A 3V1; Alberta, Environment Technical Services Division, 9820 106th St., Edmonton, Alberta T5K 2J6.

# Utah Water Supply Outlook

and

## Federal – State – Private Cooperative Snow Surveys

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## GENERAL OUTLOOK

### SUMMARY

Hopes for an average snowpack in northern Utah have faded, confirming the certainty of less than 50% streamflows this season, many of which have already flowed at peak rates. Water supplies in the southern half, however, are expected to be nearer to normal.

### SNOWPACK

The snowpack has all but vanished from northern Utah. Only small snowfields above 9,500 to 10,000 feet remain, leaving comparisons to average at 1% for the Bear, 2% for the Weber-Ogden, 2% for the Utah Lake-Provo-Jordan River and eastern Utah. There is more snow to be found, however, in the Uintah Range (18% of average) and the Sevier-Beaver (46% of average) and southwestern Utah with 43% of average. The 1988 trend of poor and sporadic snowfalls peaking early has persisted, leaving the statewide snowpack figure at 14% of average compared to 51% of average one month ago.

### PRECIPITATION

May precipitation reported at mountain snotel installations was near normal ranging from 76% of average for the Bear drainage, 94% of average for the Weber-Ogden to 103% of average for the Virgin drainage. The timing of May's precipitation events has been favorable along the Wasatch front to reducing demands on stored water for irrigation and domestic use. The seasonal mountain precipitation (since Oct. 1, 1987) ranges from 71% of average for the Weber-Ogden basin to 107% of average in southern Utah.

### RESERVOIRS

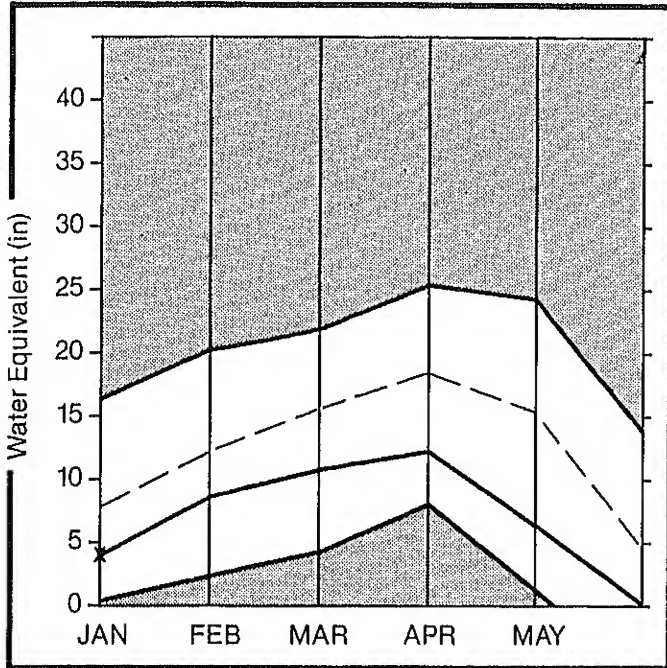
Little has changed since the May 1st analysis, where most reservoirs were storing more than usual for that date, with operators storing all available runoff in view of poor runoffs expected. Several reservoirs in the Weber-Ogden system will not fill this season.

### STREAMFLOW

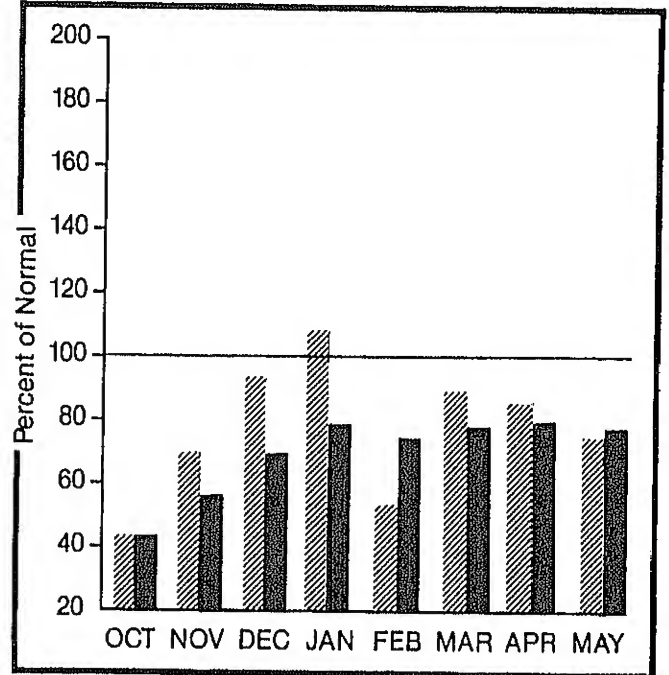
The outlook for water supplies continues to be in the 20 to 60% of average range for northern Utah reaching up to normal in the Virgin river drainage. Northern Utah is the area of concern, however, with poor volumes expected and many flows that have already peaked weeks early, direct diversion users will definitely experience shortages. Only precipitation at the right times can reduce this risk for agricultural operators this season.

# Bear River Basin

Mountain snowpack\* (inches)

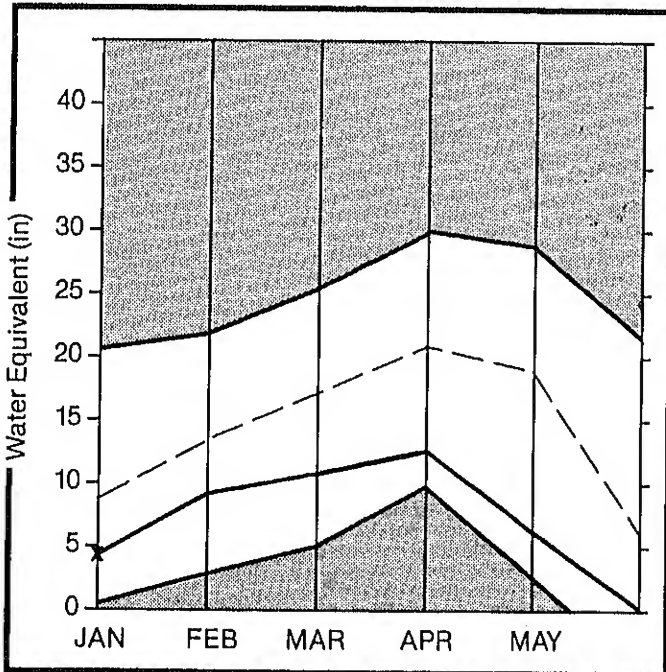


Precipitation\* (percent of normal)

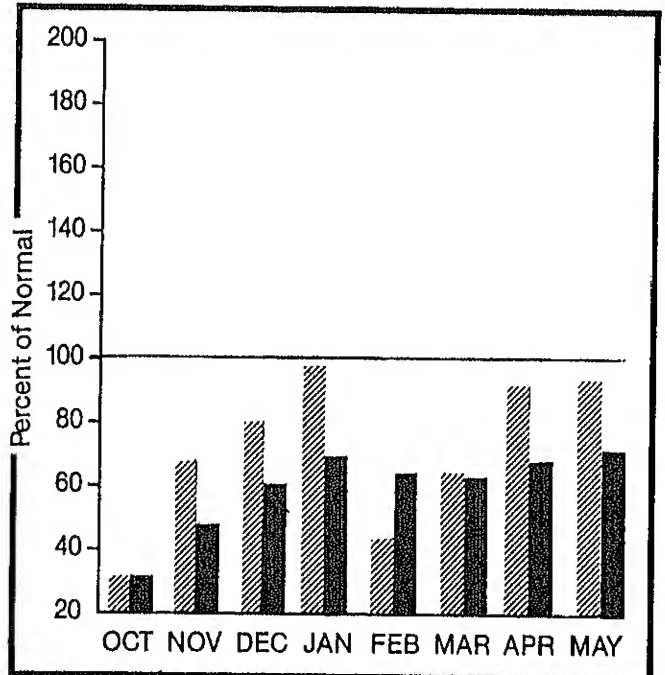


# Weber & Ogden Watersheds

Mountain snowpack\* (inches)





Precipitation\* (percent of normal)



\*Based on selected stations

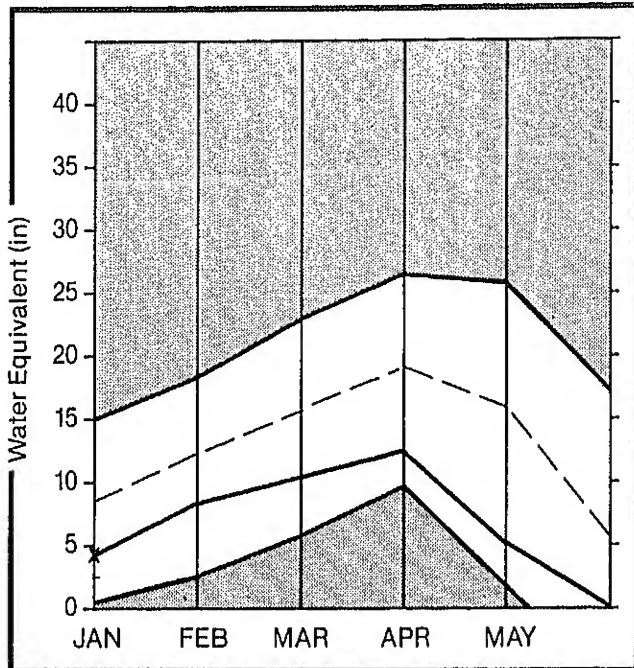
\*Based on selected stations

Maximum  Average   
Minimum  Current 

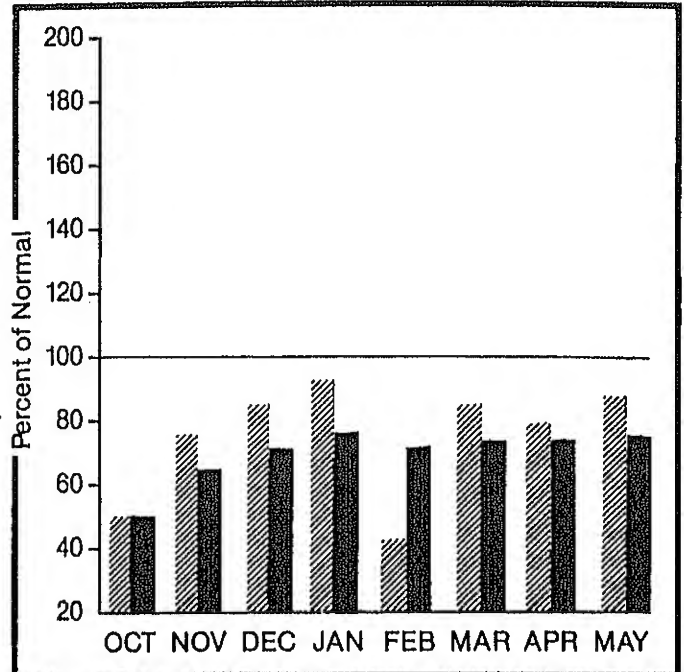
Monthly precipitation  Year to date precipitation 

## Utah Lake, Jordan River & Tooele Valley

Mountain snowpack\* (inches)

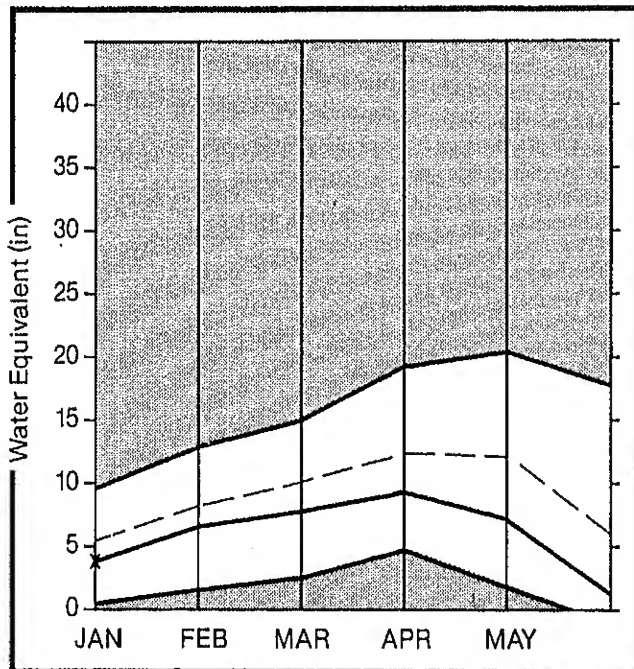


Precipitation\* (percent of normal)

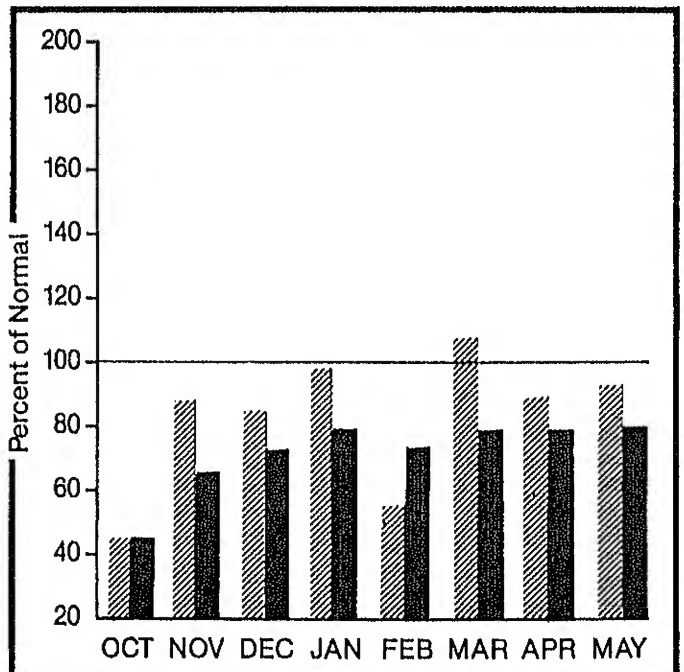


## Uintah Basin & Dagget SCD's




Mountain snowpack\* (inches)



Precipitation\* (percent of normal)



\*Based on selected stations

Maximum  Average   
 Minimum  Current 

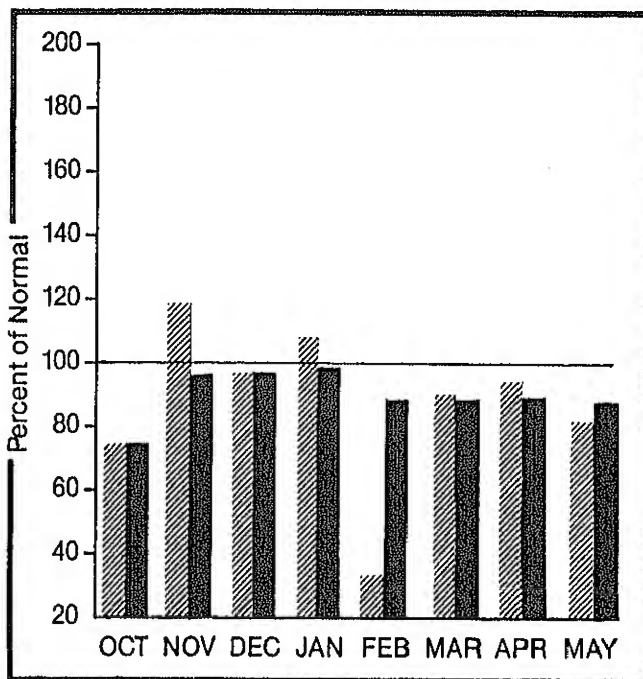
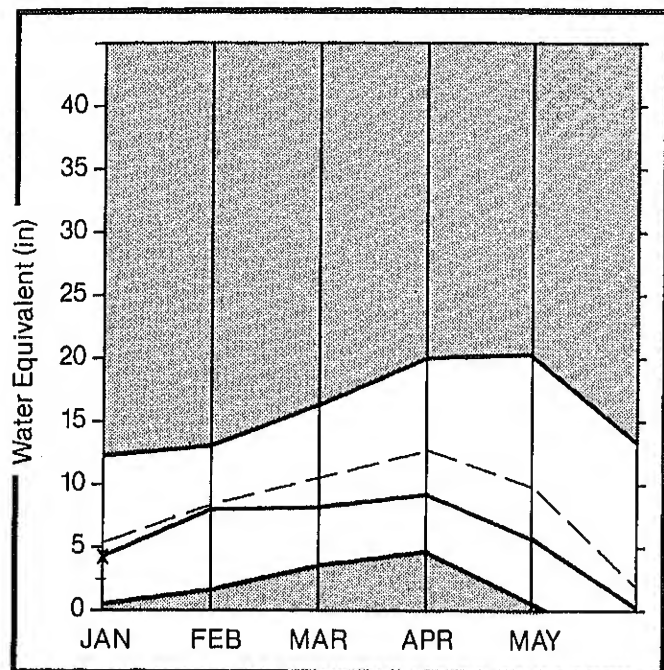
\*Based on selected stations

Monthly precipitation  Year to date precipitation 

# Carbon, Emery, Wayne, Grand, and San Juan Co.

Mountain snowpack\* (inches)

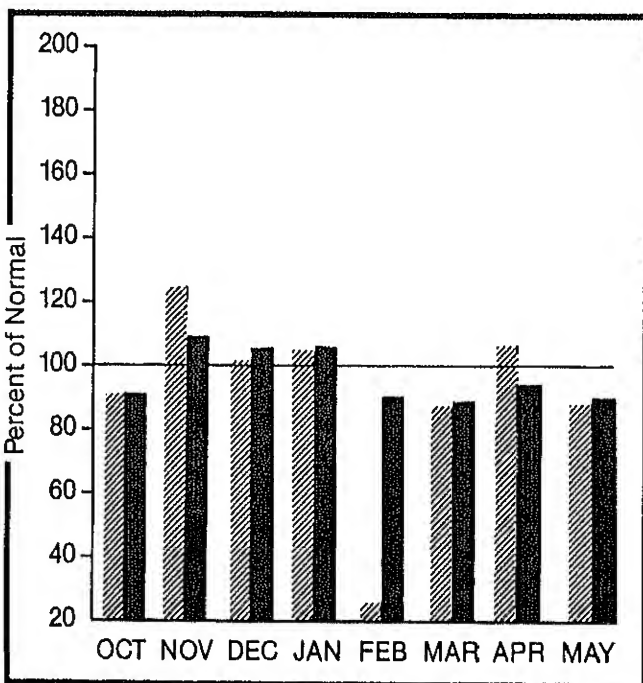
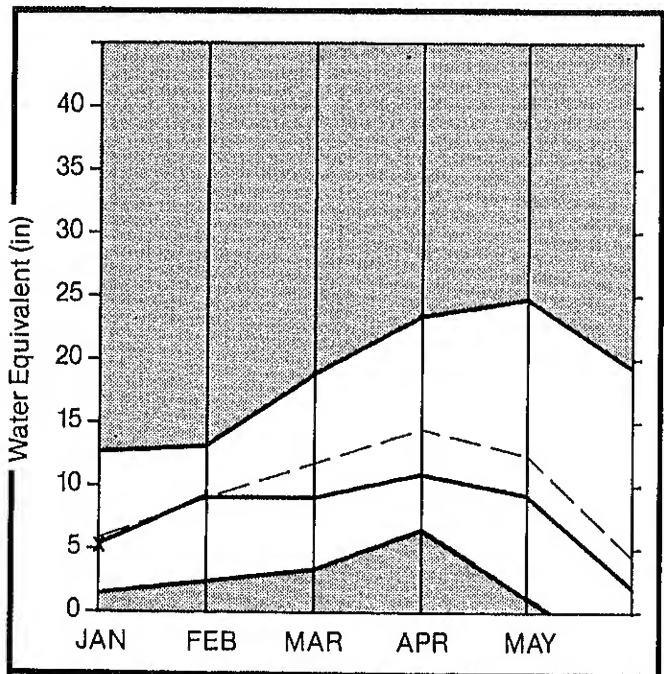
Precipitation\* (percent of normal)



## Sevier & Beaver River Basins

Mountain snowpack\* (inches)

Precipitation\* (percent of normal)



\*Based on selected stations

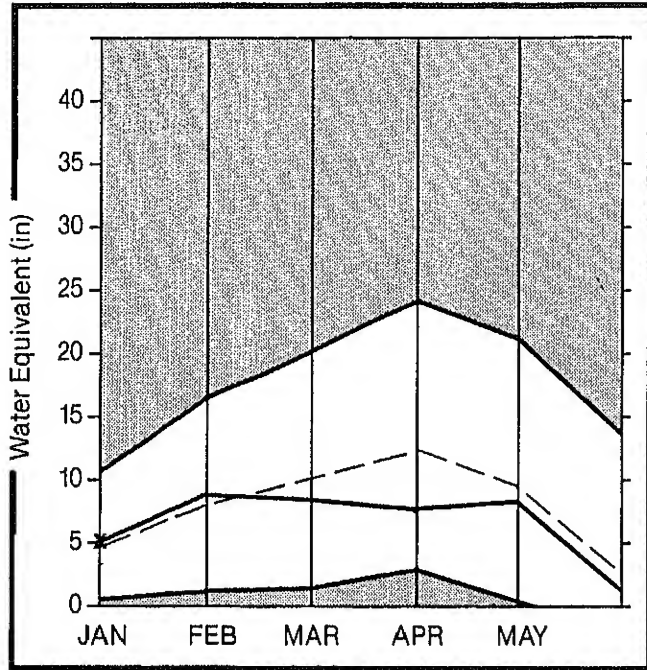
\*Based on selected stations

Maximum  Average   
Minimum  Current 



Monthly precipitation  Year to date precipitation 

# E. Garfield, Kane, Washington, & Iron Co.

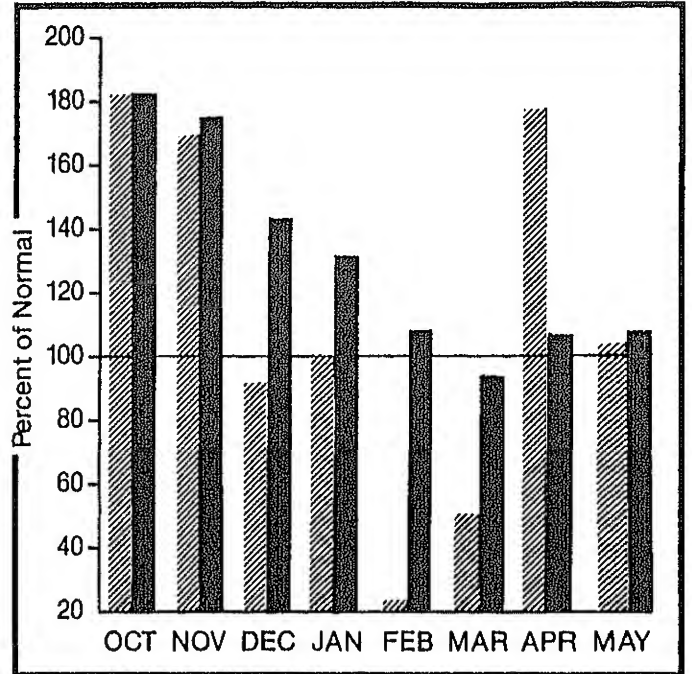
Mountain snowpack\* (inches)



\*Based on selected stations

Maximum  Average   
Minimum  Current 

Precipitation\* (percent of normal)

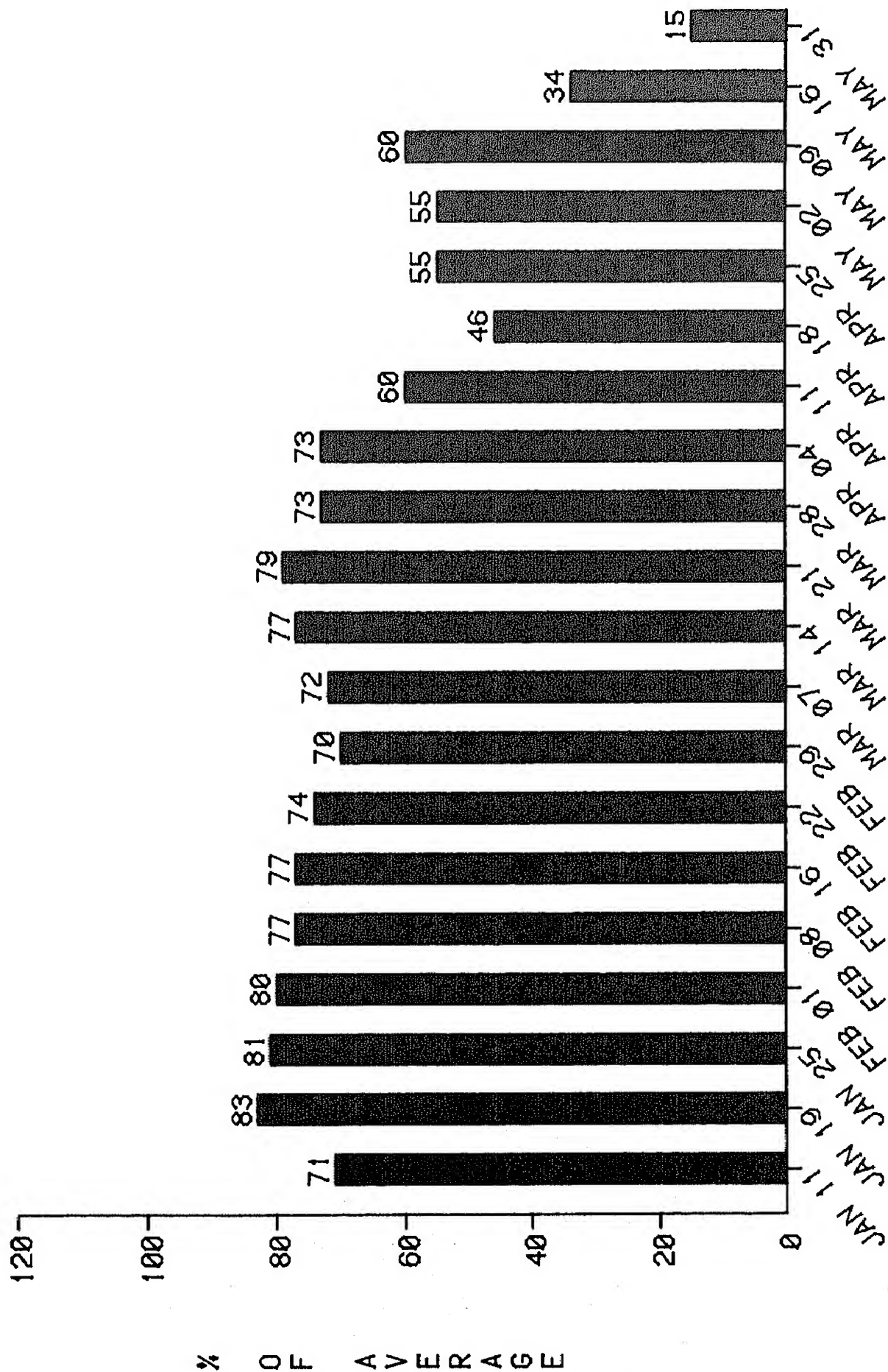


\*Based on selected stations

Monthly precipitation  Year to date precipitation 

# SNOTEL DATA

As of May 31, 1988

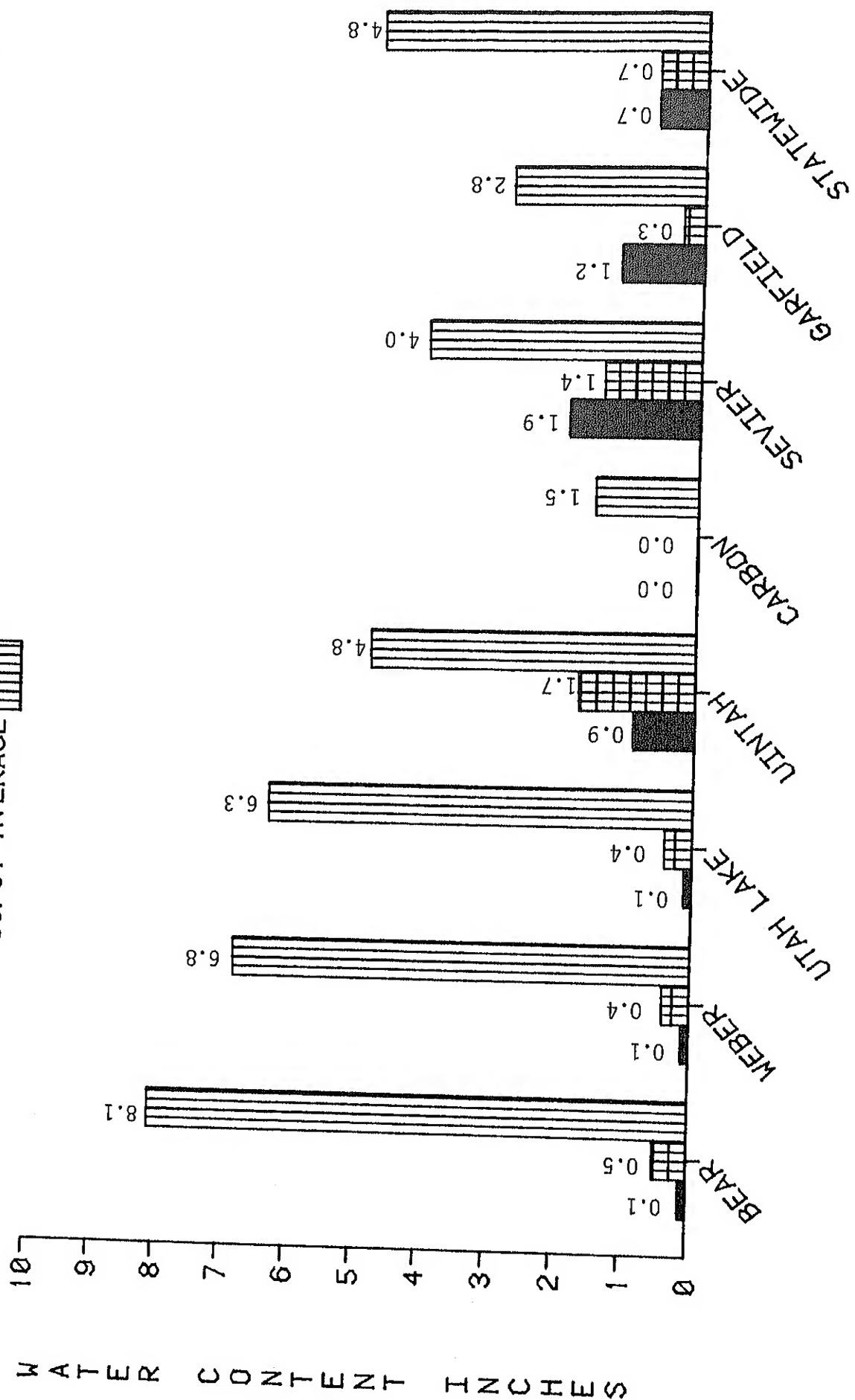


# 1988 SNOWPACK COMPARISON

June 1, 1988

06/01/87

06/01/88  
06/01 AVERAGE





United States  
Department of  
Agriculture

Soil  
Conservation  
Service



## WATER CONSERVATION

# TIPS

## FOR STRETCHING IRRIGATION WATER

### ***OTHER PLACES FOR INFORMATION OR ASSISTANCE***

Check with local ASCS office for possible special practices or cost-sharing that might assist with major irrigation changes on your farm this year.

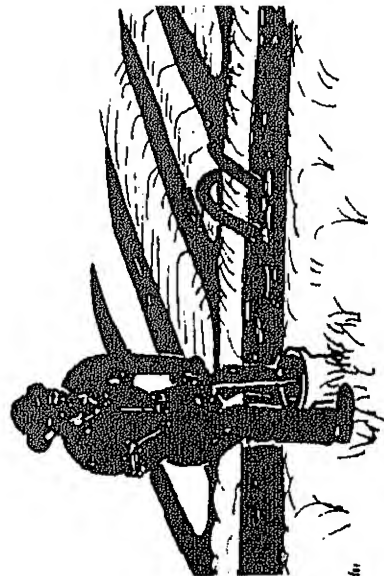
Maintain contact with Farmers Home Administration for special local programs or disaster loans available.

Maintain contact with the local Cooperative Extension Service office for agricultural and marketing conditions.

If you belong to an irrigation district, contact irrigation officials throughout the season to learn about current water availability and water supply forecasts.

Consult commercial irrigation equipment suppliers for system efficiency ideas.

Check with your local Soil Conservation Service office and Conservation District officials for details concerning your soil and water conservation problems.



Soil can absorb irrigation water only at a given rate, which varies for each soil type. Water requirements vary for different crops. Make sure you apply water to your crop only when needed. Check soil moisture by space, probe, or soil moisture meter, and make careful visual checks of your crops.

If you have a conservation plan on your farm, or if the soil in your area has been mapped, the Soil Conservation Service can cross-check soil type and irrigation data and provide you with the water holding capacity of your soil for a given crop.

Don't know if your soil has been mapped? Check with the local SCS office. Even if the soil has not been mapped, the SCS can supply you with general information.

Water stretching measures are important to most farmers in the West. To use your available water in the most productive way possible, here's a checklist to help you analyze your irrigation system.

## IRRIGATION SYSTEMS

Inspect your system *before* water starts to flow.

Make sure ditches are clean and free from weeds, sediment, or other debris which can slow water velocity, affect delivery rate and increase evaporation.

Consider lining ditches with concrete or plastic. This could avoid the 10-90 percent loss which often occurs in ditches.

Make sure ditch structures — like headgates, drop structures, and pipe inlets — are strong and functional. A washed-out ditch structure could mean a lot of water lost.

Make sure ditchbanks are firm and not burrowed into by rodents. Rodent holes could cause leakage or failures.

Make sure your pump is operating at peak efficiency. Adequate maintenance will improve efficiency, guard against water loss, and avoid shutdowns.

## SPRINKLER SYSTEMS

Make sure nozzles aren't worn and leaky. Check pipe connections and valves to prevent leaks.

Operate sprinklers at recommended pressure. Use application rate, efficiency factor and time of application to figure how much to apply.

Consider trickle systems for orchards, vineyards, etc. Operate at recommended design values and maintain the filter system.

## IRRIGATION MANAGEMENT

Measure the amount of water applied to the field. This can indicate when and how much to irrigate.

Consider alternate row irrigation for crops planted in furrows. But remember to alternate the "alternate" row in later irrigations.

Consider shorter runs if you furrow irrigate. Match stream size and velocity to soil intake rate and capacity.

Consider catching and re-using tail water by pumping it back to the head of the system or re-using elsewhere.

Irrigate most crops when soil moisture reaches about 50 percent of capacity.



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Service



## WATER CONSERVATION

# TIPS

### FOR STRETCHING

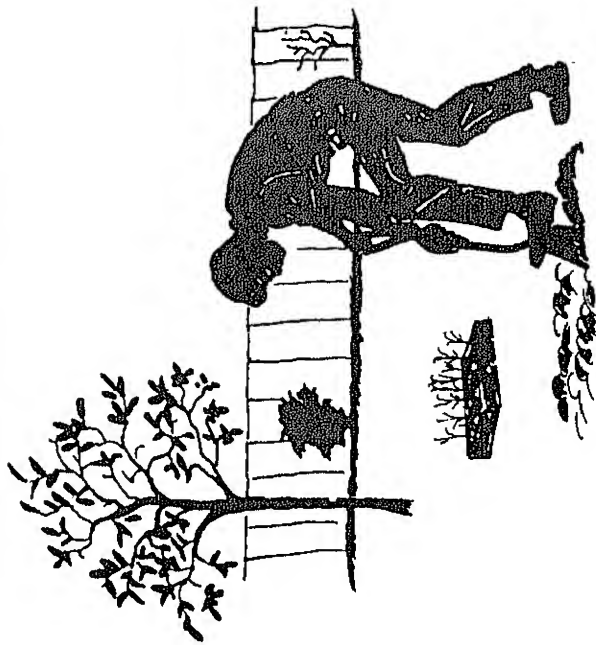
### WATER FOR

### YARDS AND GARDENS

#### **OTHER PLACES FOR INFORMATION OR ASSISTANCE**

Consult commercial nursery or garden suppliers for plant watering requirements and recommendations.

Check with your local Soil Conservation Service office, Conservation District officials, or Cooperative Extension Service office for details concerning your water conservation questions.



# *Surviving a Water Shortage Takes Good Management*

What can be done to nurture trees, shrubs, lawns and gardens through a water-short year?

First, try to learn all you can about how much water will be available and what regulations might be put into effect.

Absorb all you can about relationships among soil, water and plants — especially your own.

Develop a plan for applying water based on supply, needs, alternatives and current conditions.

Observe and measure how your plan is working.

Those plant, water and soil relationships are crucial to success of your management plan.

Plants differ in how much water they need to survive or prosper — and this varies with climate and changing weather conditions.

Sprinklers and other devices for applying water vary in how fast they can deliver water.

And finally, soils differ in how fast they absorb moisture, how much they store and how long they retain it.

A rule of thumb says 1 inch of moisture will penetrate 12 inches deep in sandy soil; 7 inches in loam, and 4 to 5 inches in clay.

## *ALTERNATIVES*

Save water for plants that can't survive without it.

Reduce watering of other plants to subsistence level. (Lawns can do without water for a long time and green up again when moisture is available.)

Don't plant annuals when water shortage is imminent.

If a vegetable garden is important, many perennials can do without water better than annuals can.

Hold up on new landscaping or consider desert or native plants.

If you were planning to remove any lawn, trees or shrubs in the future; this would be the year to do the work before you start watering.

Change your lawn and garden watering system. Try automatic, drip or different sprinkler heads for better efficiency.

## *APPLY WATER EFFICIENTLY*

Water deep and less often. Shallow, frequent watering encourages shallow roots, more evaporation loss and reduces the moisture reservoir in the soil.

For best results check how long it takes to soak the entire root zone and how long this watering will last.

Don't apply water faster than soil can absorb.

Don't let water run off into street or driveway.

Water early in the day to reduce evaporation loss.

## *CONSERVE MOISTURE*

Mulch around trees and shrubs and between garden rows. This holds in moisture, discourages weeds which compete for moisture.

Aerate your lawn to permit better water penetration.

Set your lawn mower blade to leave 2 or more inches of grass after mowing.

Fertilize adequately. A sick looking lawn or garden many need more fertilizer, not more water. Apply fertilizer before regular watering.

If it rains, reduce watering time accordingly. Measure how much rain has fallen, adjust watering schedule and duration accordingly.

# The Following Organizations Cooperate With The Soil Conservation Service In Snow Survey Work

## ate

Utah State University  
Utah State Department of Natural Resources  
Division of Wildlife Resources  
Division of Water Resources  
Division of Water Rights  
Bear River Commissioner  
Price River Commissioner  
Provo River Commissioner  
Sevier River Commissioners  
Spanish Fork River Commissioner  
Utah Lake and Jordan River Commissioner

## deral

U.S. Department of Agriculture  
Soil Conservation Service  
Forest Service  
U.S. Department of Commerce  
NOAA, National Weather Service  
U.S. Department of Interior  
Bureau of Reclamation  
Geological Survey  
National Park Service

## municipality

Manti  
Salt Lake City

## blie

Beaver River Water Users Association  
Board of Canal Presidents - Jordan River  
Central Utah Conservancy District  
Emery Canal and Reservoir Company  
Moon Lake Water Users Association  
Ogden River Water Users Association  
Provo River Water Users Association  
Strawberry Water Users Association  
Sevier River Water Users Association  
Weber River Water Users Association  
Weber Basin Conservancy District

Other organizations and individuals furnish  
information for the snow survey reports.  
Their cooperation is gratefully acknowledged.

All programs and services of U.S. Dept.  
of Agriculture are available to everyone  
without regard to race, creed, color, sex,  
age, handicap, or national origin.